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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/775,619 | 02/05/2001 | Motoyuki Hirata | Q62599 | 8354 |

7590 10/27/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, DC 20037-3213

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| EXAMINER |
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LORENZO, JERRY A

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| ART UNIT | PAPER NUMBER |
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1734

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DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS12

Office Action Summary

Application No.

09/775,619

Applicant(s)

HIRATA ET AL.

Examiner

Jerry A. Lorengo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 17-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

(1)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 17-22, 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,470,357 to Schmutz et al.

Regarding claims 17 and 18, Schmutz et al. disclose a battery obtained by (column 9, lines 15-37):

- (1) Providing a first solid polymer electrolyte (SPE) film 43;
- (2) Providing a first porous electrode (copper collector grid) 41;
- (3) Contacting and bonding the first SPE film 43 to the first porous electrode 41 to form a first composite electrode;
- (4) Providing a second solid polymer electrolyte (SPE) film 47;
- (5) Providing a second porous electrode (aluminum collector grid) 49;
- (6) Contacting and bonding the second SPE film 47 to the second porous electrode 49 to form a second composite electrode;
- (7) Superposing the first composite electrode on the second composite electrode with an electrolyte/separator element 45 disposed therebetween to form a battery; and
- (8) Impregnating the first and second SPE films 43,47 with an electrolytic solution.

Regarding applicant claims 19 and 20, Schmutz et al. disclose that the first and second SPE films are obtained from a polymerizable compound, i.e., vinylidene fluoride and hexafluoropropylene copolymer, dissolved in a solvent, i.e., acetone (column 4, line 66 to column 5, line 20).

Regarding applicant claims 21 and 22, Schmutz et al. disclose that the SPE films have an ionic conductivity at room temperature of between 2×10^{-3} to 9×10^{-5} S/cm (column 1, lines 62-67; column 5, lines 23 to 63).

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Regarding applicant claims 26 and 27; Schmutz et al. disclose that the SPE films, prior to impregnation with the electrolytic solutions, contain no electrolyte salt (column 2, lines 30-40).

(2)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,470,357 to Schmutz et al.

Although Schmutz et al., as set forth in section (1), above, disclose the overall battery set forth in claims 30 and 31, they do not specifically disclose, as per applicant claims 30 and 31, that the composite porous electrode with an electrolytic solution has a concentration of an electrolyte salt greater than a concentration at which the electrolytic solution has a maximum

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conductivity. Nonetheless, the skilled artisan would have appreciated that the ion conductivity would be increased motivated by the fact that Schmutz et al. discloses that introduction of the electrolytic solution into the polymer electrolyte constituent of the porous electrode composite causes it to swell (column 5, lines 23-52). Therefore, it would have a greater concentration than the electrolytic solution has at its maximum conductivity, i.e., at maximum saturation, because the polymer electrolyte is capable of swelling and entraining a higher concentration of electrolyte salt and thus exhibit a concentration and conductivity higher than that achievable by a saturated electrolytic solution alone.

(3)

Claims 23-25, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,470,357 to Schmutz et al. in view of U.S. Patent No. 5,858,264 to Ichino et al.

Regarding applicant claims 23-25, although Schmutz et al. disclose that the SPE film is formed from a polymerizable compound, i.e., vinylidene fluoride and hexafluoropropylene (VdF:HFP) copolymer, dissolved in a solvent, i.e., acetone (column 4, line 66 to column 5, line 20), they do not specifically disclose that the SPE film contains a cross-linking polymer having a urethane bond and an oxyalkylene group.

Regarding applicant claims 32 and 33, although Schmutz et al. disclose that the SPE films are impregnated with an electrolytic solution by immersion, they do not specifically disclose that the SPE film is compounded with an electrolyte salt prior to being polymerized to form the SPE film.

With regards to applicant claims 23-25, it would have, however, been obvious to one of ordinary skill in the art at the time of invention to substitute the VdF:HFP copolymer disclosed by Schmutz et al. with a cross-linking polymer having a urethane bond and an oxyalkylene group motivated by the fact that Ichino et al., also drawn to methods for the formation of SPE films, discloses that the polymer making up the SPE film may comprise polymers such a vinylidene fluoride or methyl acrylate (a material that has a urethane bond and an oxyalkylene group) and other crosslinking polymers having a crosslinked structure of covalent or ionic bonds (column 4, lines 29-59).

Likewise, with regards to applicant claims 32 and 33, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize a SPE film in the method of Schmutz

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et al. which is compounded with an electrolyte salt prior to being polymerized to form the SPE film motivated by the fact that Ichino et al. disclose that the introduction of the electrolyte salt into the SPE film either before SPE film formation (by incorporation into the SPE film forming polymer mixture) or after SPE film formation (by immersion in an electrolyte salt solution) are functional expedients well-recognized within the art (column 5, lines 1-22).

(4)

Response to Amendments and Arguments


The amendments and arguments filed October 6, 2003 upon the filing of the Request for Continued Examination (RCE) are acknowledged. In response thereto, a new grounds of rejection, as set forth in sections (1) to (3), above, has been founded. As such, the Applicant's arguments with respect to claims 17-33 have been considered but are moot in view of the new ground(s) of rejection.

(5)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry A. Lorengo whose telephone number is (703) 306-9172. The examiner can normally be reached on Monday through Friday, 8:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (703) 308-3853. Please note that all patent application related correspondence transmitted by FAX must be directed to the central FAX number at 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


J.A. Lorengo
Primary Examiner
AU 1734
October 18, 2003